

[0021] The training pant 20 is illustrated in FIG. 1 in a fully assembled (i.e., as assembled during initial manufacture) configuration (broadly referred to herein as a wear configuration of the pant) having a waist opening 50 and a pair of leg openings 52. The training pant 20 includes an inner surface 28 configured for contiguous relationship with the wearer, and an outer surface 30 opposite the inner surface. With additional reference to FIG. 2, the training pant includes an outer cover 40, a bodyside liner 42 opposite the outer cover 40, and an absorbent structure 100 disposed between the outer cover 40 and the bodyside liner 42. Arrows 48 and 49 in FIG. 2 depict the orientation of a longitudinal axis and a transverse or lateral axis, respectively, of the training pant 20.

[0022] The bodyside liner 42 is connected to the outer cover 40 in a superposed relation by suitable means such as adhesives, ultrasonic bonds, thermal bonds, pressure bonds, or combinations thereof.

[0023] The outer cover 40 suitably comprises a material which is substantially liquid impermeable. The outer cover 40 can be a single layer of liquid impermeable material, but more suitably comprises a multi-layered laminate structure in which at least one of the layers is liquid impermeable. For instance, the outer cover 40 can include a liquid permeable outer layer and a liquid impermeable inner layer that are suitably joined together by an adhesive, ultrasonic bonding, thermal bonding, pressure bonding, or combinations thereof. Suitable adhesives can be applied continuously or intermittently as beads, a spray, parallel swirls, or the like. The liquid permeable outer layer can be any suitable material, including materials that provide a generally cloth-like texture. The outer layer may also be made of those materials of which the liquid permeable bodyside liner 42 is made. While it is not a necessity for the outer layer to be liquid permeable, it is suitable that it provides a relatively cloth-like texture to the wearer.

[0024] The inner layer of the outer cover 40 can be both liquid and vapor impermeable, or it may be liquid impermeable and vapor permeable. The inner layer can be manufactured from a thin plastic film, although other flexible liquid impermeable materials may also be used. The inner layer, or the liquid impermeable outer cover 40 when a single layer, prevents waste material from wetting articles, such as bed sheets and clothing, as well as the wearer and caregiver.

[0025] If the outer cover 40 is a single layer of material, it can be embossed and/or matte finished to provide a more cloth-like appearance. As earlier mentioned, the liquid impermeable material can permit vapors to escape from the interior of the disposable absorbent article, while still preventing liquids from passing through the outer cover 40. One suitable "breathable" material is composed of a microporous polymer film or a nonwoven fabric that has been coated or otherwise treated to impart a desired level of liquid impermeability.

[0026] It is also contemplated that the outer cover 40 may be stretchable, and more suitably elastic. In particular, the outer cover 40 is suitably stretchable and more suitably elastic in at least the transverse, or circumferential direction of the pant 20. In other embodiments the outer cover 40 may be stretchable, and more suitably elastic, in both the transverse and the longitudinal direction.

[0027] The liquid permeable bodyside liner 42 is illustrated as overlying the outer cover 40 and absorbent structure 100, and may, but need not, have the same dimensions as the outer cover 40. The bodyside liner 42 is suitably compliant, soft feeling, and non-irritating to the wearer's skin. The bodyside liner 42 is also sufficiently liquid permeable to permit liquid

body exudates to readily penetrate through its thickness to the absorbent structure 100. Further, the bodyside liner 42 can be less hydrophilic than the absorbent structure 100 to present a relatively dry surface to the wearer and permit liquid to readily penetrate through its thickness. The hydrophilic/hydrophobic properties can be varied across the length, width and/or depth of the bodyside liner 42 and absorbent structure 100 to achieve the desired wetness sensation or leakage performance.

[0028] The bodyside liner 42 can be manufactured from a wide selection of web materials, such as porous foams, reticulated foams, apertured plastic films, woven and non-woven webs, or a combination of any such materials. For example, the bodyside liner 42 may comprise a meltblown web, a spunbonded web, or a bonded-carded-web composed of natural fibers, synthetic fibers or combinations thereof. The bodyside liner 42 may be composed of a substantially hydrophobic material, and the hydrophobic material may optionally be treated with a surfactant or otherwise processed to impart a desired level of wettability and hydrophilicity. The surfactant can be applied by any conventional means, such as spraying, printing, brush coating or the like. The surfactant can be applied to the entire bodyside liner 42 or can be selectively applied to particular sections of the bodyside liner, such as the medial section along the longitudinal center line.

[0029] The bodyside liner 42 may also be stretchable, and, more suitably, it may be elastomeric. In particular, the bodyside liner 42 is suitably stretchable and more suitably elastomeric in at least the transverse 49, or circumferential direction of the pant 20. In other embodiments the bodyside liner 42 may be stretchable, and more suitably elastomeric, in both the transverse 49 and the longitudinal 48 directions.

[0030] Suitable elastomeric materials for construction of the bodyside liner 42 can include elastic strands, LYCRA elastics, cast or blown elastic films, nonwoven elastic webs, meltblown or spunbond elastomeric fibrous webs, as well as combinations thereof. Examples of suitable elastomeric materials include KRATON elastomers, HYTREL elastomers, ESTANE elastomeric polyurethanes (available from Noveon of Cleveland, Ohio), or PEBAX elastomers. The bodyside liner 42 can also be made from extensible materials as are described in U.S. patent application Ser. No. 09/563,417 filed on May 3, 2000 by Roessler et al. or from biaxially stretchable materials as are described in U.S. patent application Ser. No. 09/698,512 filed on Oct. 27, 2000 by Vukos et al., both of which are hereby incorporated by reference.

[0031] The absorbent structure 100 is suitably compressible, conformable, non-irritating to a wearer's skin, and capable of absorbing and retaining liquids and certain body wastes. The absorbent structure 100 may be formed from a variety of suitable materials. In one suitable embodiment, the absorbent structure 100 is formed from a suitably resilient, compressible material, such as low-density polyethylene. Examples of other suitable materials from which the absorbent structure 100 may be formed include rubber-like or elastomeric materials, such as TangoPlus Fullcure® 930 (available from Objet Inc. of Billerica, Mass.). It is also contemplated that the absorbent structure may be formed from engineered nano-cellular composites, such as polypropylene-based cellular foams.

[0032] In one suitable embodiment, the absorbent structure 100 is formed by an additive manufacturing process, also known as "3D" printing. Suitable additive manufacturing processes include, for example, fused deposition modeling